

MAGELLAN MISSION REPORT: THE FINAL CHAPTER

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The Magellan spacecraft which has been orbiting Venus since August 10, 1990 will be deliberately plunged into the Venusian atmosphere in October 1994. Magellan had the objectives of (1) improving the knowledge of the geological processes, surface properties and geologic history of Venus by analysis of surface radar characteristics, topography and morphology and (2) improving the knowledge of the geophysics of Venus by analysis of Venusian gravity.

The first objective was supported by radar imaging, altimetric and radiometric mapping of the Venusian surface from September 1990 until September 1992 (mission cycles 1,2,3). Some 98 percent of the surface has been mapped with radar resolution on the order of 120 meters. Over 1200 radar image products are available as analog photographs and digital compact disks (C-D-ROMS) at the National Space Science Data Center (NSSDC), Goddard Space Flight Center. In addition, the altimetric and radiometric data products from M1' anti the cartographic maps from USGS are available at the NSSDC. A contact for these Magellan data products is the PDS Geosciences Node at Washington University, St. Louis, Missouri (e-mail: slavney@wunder.wustl.edu).

The second objective was supported by high resolution Doppler tracking of the spacecraft from September 1992 to October 1994 (mission cycles 4,5,6). Some 950 orbits of high-resolution gravity observations were obtained between September 1992 and May 1993 while Magellan was in an elliptical orbit with a periapsis near 175 kilometers and an apoapsis near 8,000 kilometers. An additional 1500 orbits will likely be obtained since orbit-circularization in mid-1993. These data exist as a 75 degree-by-75-degree harmonic field produced by Bill Sjogren of JPL. This and other Magellan gravity products are available at NSSDC also.

Magellan has also provided information about the Venusian atmosphere. The high effective power of the Magellan downlink radio system enabled the deepest probing of the Venusian atmosphere by occultation. Also, atmospheric drag measurements, particularly during aerobraking and in this October's final plunge into the Venusian atmosphere, have expanded upon those originally obtained with the Pioneer-Venus spacecraft and have validated the Venus International Reference Atmosphere (VIRA).